AF/GP1731$

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	MIZUSUGI ET AL.	Examiner:	S. GRIFFIN
Serial No.:	08/858,116	Group Art Unit:	1731
Filed:	MAY 19, 1997	Docket:	8373.52USF2
Due Date:	DECEMBER 5, 1998 (SATURDAY)		
Title:	METHOD OF BENDING SHEET GLASS		

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: BOX AF Assistant Commissioner for Patents, Washington, D.C. 20231, on December 7, 1998.

By: Curtis B. Hamre
Curtis B. Hamre

BOX AF
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

We are transmitting herewith the attached:

☒ Transmittal Sheet in duplicate containing Certificate of Mailing
☒ Check(s) in the amount of $300.00, for brief on appeal
☒ Other: Appellants' Brief on Appeal with Appendix 1 (in triplicate)
☒ Return postcard

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers, if appropriate. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725. A duplicate of this sheet is enclosed.

MERCHANT, GOULD, SMITH, EDELL,
WELTER & SCHMIDT
3100 Norwest Center, Minneapolis, MN 55402
(612) 332-5300

By: Curtis B. Hamre
Name: Curtis B. Hamre
Reg. No.: 29,165
CBH:PSTkaw

1083

#33
R.C.H.
12-17-98

S/N 08/858,116

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	MIZUSUGI ET AL.	Examiner:	S. GRIFFIN
Serial No.:	08/858,116	Group Art Unit:	1731
Filed:	MAY 19, 1997	Docket No.:	8373.52USF2
Title:	METHOD OF BENDING SHEET GLASS		

CERTIFICATE UNDER 37 CFR 1.8:
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on December 7, 1998.

Curtis B. Hamre

Curtis B. Hamre

APPELLANTS' BRIEF ON APPEAL

BOX AF
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This Brief is filed in perfection of the Notice Appeal from the rejection of claims 5–8 and 10 filed October 5, 1998.

A check for $300.00 to cover the required fee for filing this Brief is enclosed. An original and two copies of the Brief are enclosed herewith.

I. IDENTIFICATION OF REAL PARTY IN INTEREST

The present application is assigned to Nippon Sheet Glass Co., Ltd., of Osaka, Japan.

II. IDENTIFICATION OF RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any appeals or interferences that would directly effect or be directly affected by the outcome of the present appeal.

III. STATUS OF CLAIMS

Claims 5–8 and 10 are pending in this application and are the subject of this appeal. Claims 1–4 and 9 were cancelled during prosecution.

IV. STATUS OF AMENDMENTS

No Amendments were filed after receiving the final rejection dated July 17, 1998.

V. SUMMARY OF THE INVENTION

The present invention relates to a method of shaping a sheet of glass using suction molds successively.

A sheet of glass is heated in a furnace nearly to a softening point. The glass is then moved by conveyor rollers to a station for shaping. The conveyor rollers are lowered so that the glass sheet is placed on a ring mold. A suction mold is lowered toward the ring mold until the shaping surface areas of the suction mold come close to the sheet of glass on the ring mold. The suction mold is divided into first and second chambers having respective first and second shaping surface areas. A first vacuum is developed in the first suction chamber at a first time to attract a first area of the sheet of glass against the first shaping surface area. Thereafter, a second vacuum in the second suction chamber at a second time attracts a second area of the sheet of glass against the second shaping surface area. The first and second areas of the sheet of glass are in this way shaped complementary to one another.

After the shaping, the sheet of glass is released from the suction mold unto a quenching ring and moved to a quenching station.

Bringing the suction mold close to the sheet of glass which rests on the ring mold and then attracting the sheet of glass to the first shaping surface area using a first vacuum and thereafter attracting a second area of the sheet of glass to a second shaping surface area using a second vacuum avoids the forcing by a ring mold direct contact between the sheet of glass and the suction mold and in combination with the successive application of first and second vacuums avoids capturing air bubbles between the sheet of glass and the shaping surfaces of the suction mold. In this way, the present invention provides higher quality shaping than conventional

shaping. Likewise, since the shaping is done successively, there does not develop the same kind of stretching and possible rupturing of the sheet of glass as occurs with conventional methods.

VI. ISSUES ON APPEAL

The following issues from the July 17, 1998, final rejection are presented for appeal:

1. Whether claims 5–8 and 10 are unpatentable over U.S. Patent 4,229,200 (Seymour) in view of U.S. Patent 4,609,391 (McMaster).

2. Whether claims 5–8 and 10 are unpatentable over Seymour in view of U.S. Patent 4,859,225 (Kuster '225). It is noted that U.S. Patent 5,352,263 (Kuster '263) has been distinguished and is not in issue.

VII. GROUPING OF CLAIMS

For the purposes of the present appeal only, claims 5–8 and 10 are considered to stand or fall together.

VIII. ARGUMENT

The invention of the present claims is not disclosed by the combination of Seymour and McMaster or the combination of Seymour and Kuster '225.

A. Disclosures of the References

Seymour is directed to "drop forming glass sheets with auxiliary shaping means". Seymour discloses a bending and tempering line including a furnace 10, a bending station 11, a tempering station 12, and an unloading station 13. The furnace heats the glass until it is appropriately hot and soft. The bending station has a locator frame 35 with a vacuum platen 40 directly overhead. Seymour states at column 5, lines 64–66, "the flatness and rigidity of the bottom plate 41 of the vacuum platen are important factors for the successful practice of the present invention." According to the various embodiments, the vacuum platen may be lowered to the vicinity of the glass sheet so that when sufficient vacuum is applied the glass sheet is drawn into contact and lifted as the vacuum platen is raised. Alternatively, a lifting ring 102 raises the glass sheet to the vacuum platen. As in Figures 21 and 22, the flat platen 40 may be

flanked by a pair of curved vacuum mold suctions 130 which also communicate with a source of vacuum. In that case, the lifting frame continues to press the glass sheet toward suctions 130 after the glass sheet attaches to the flat platen 40. In any case, the glass sheet is separated by six to eight inches from a shaping mold. A vacuum is quickly taken away so that the glass sheet can drop into the shaping mold. It is the shaping mold which provides the desired shape for the product glass. Upon receiving the dropped glass sheet, the shaping mold is immediately transferred out of the bending station into the tempering station and ultimately to the unloading station.

McMasters teaches the forming of glass sheets by an entirely different process, namely, engaging them with molds both beneath and above the glass sheets. Whereas Seymour uses the shaping mold to move the glass sheets from the vending station to the tempering station, McMasters teaches the use of a transfer mold which could be in the form of a ring.

Kuster '225 also teaches an entirely different process. Kuster discloses a method wherein an annular frame presses a sheet of glass against a solid surface curing form such that thereafter hot gas can be forced against the form to bend the glass. The annular frame (or wagon) is then used to move the bent glass to a tempering station.

B. <u>Seymour in View of McMasters or Kuster '225 does not Suggest Claim 10</u>

Claim 10 defines a method of shaping a sheet of glass with a suction mold that includes first and second suction chambers having respective first and second shaping surface areas. The method includes first placing the sheet of glass on a ring mold. Next the method requires lowering the suction mold toward the ring mold to an extent that the shaping surface areas come close to the sheet of glass on the ring mold. After that, a first vacuum is developed in the first suction chamber at a first time to attract a first area of the sheet of glass against the first shaping surface area to shape the first area of the sheet of glass. Then, a second vacuum is developed in the second suction chamber at a second time to attract a second area of the sheet of glass against the second shaping surface area to shape the second area of the sheet of glass complementary to the first area. The first time is before the second time so that the sheet of glass is successively brought against the first and second shaping surface areas. Thereafter, the sheet of glass is

released from the first and second shaping surface areas of the suction mold onto a quenching ring and moved on the quenching ring to quenching.

Claim 10 defines a method which includes shaping using a first vacuum and then shaping using a second vacuum so that the shaping is successive. After the first and second vacuums are developed and the first and second areas of the sheet of glass are shaped to be complementary, the sheet of glass is released from the shaping surface areas of the suction mold onto a quenching ring to be moved to quenching. The references teach different processes and do not suggest the method of claim 10. In particular, Seymour very clearly requires a flat and rigid bottom plate for the vacuum platen. Seymour indicates that the flat vacuum platen is an important factor to the success of the invention. The process of Seymour uses the vacuum step to hold the sheet of glass momentarily while the shaping mold is properly placed and then releases the vacuum quickly so that the glass can fall into the shaping mold and be shaped by the impact. The process of Seymour is incredibly and clearly and distinctly different from the method of claim 10. The vacuums are used to shape the sheet of glass in the method of claim 10 and then the sheet of glass is released from the shaping surface areas directly to the quenching ring. Seymour does not suggest such a method. Furthermore, the methods of McMaster and Kuster '225 are just as distinctly different from the method of claim 10 as is Seymour. McMaster and Kuster '225 simply show some form of ring structure for moving the glass sheet to a tempering station, such as quenching. The advantages due to the difference in method between that defined by claim 10 and the references is non trivial. The method of claim 10 eliminates the possibility of air bubbles or of excessively stretching, either of which can occur when a ring passes or forces the edges of a glass sheet toward a shaping structure and a vacuum is drawn. Furthermore, the possibility of breakage due to the dropping of a glass sheet as in Seymour is clearly not present in the method of claim 10. The method defined by claim 10 is, consequently, not only very different, but leads to non trivial advantages. The method of claim 10 is non–obvious and patentable.

The other claims depend from claim 10 and further define the method and are also patentable.

IX. CONCLUSION

In view of the above, Appellants submit that the obviousness rejections of the final rejection are untenable and should be reversed.

Please charge any additional fees or credit overpayment to Merchant & Gould Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT, GOULD, SMITH, EDELL,
WELTER & SCHMIDT, P.A.
3100 Norwest Center
90 South Seventh Street
Minneapolis, Minnesota 55402
(612) 332-5300

Date: Dec. 7, 1998

Curtis B. Hamre

Curtis B. Hamre
Reg. No. 29,165
CBH:PSTkaw

APPENDIX 1

5. A method according to claim 10, wherein said sheet of glass includes a side area on each side of a central area therebetween, and wherein said shaping mold includes a pair of said second shaping surface areas and said second suction chambers with one on each side of said first shaping surface area and said first suction chamber, respectively, said second shaping surface areas being curved, said then developing a second vacuum step comprising said ring mold being maintained spaced from said curved second shaping surface areas while vacuum is developed in said second suction chambers, said side areas of the sheet of glass being attracted by the vacuum and shaped against the curved second shaping surface areas.

6. A method according to claim 5, wherein said side areas of the sheet of glass are shaped successively from the central to the side areas.

7. A method according to claim 10, wherein said shaping surface areas further comprise a metal or glass cloth covering.

8. A method according to claim 10, wherein the sheet of glass is substantially planar prior to attracting it against the shaping surface areas.

10. A method of shaping a sheet of glass heated nearly to a softening point thereof with a suction mold including first and second suction chambers having respective first and second shaping surface areas, comprising the steps of:

placing the sheet of glass on a ring mold;

lowering said suction mold toward said ring mold to an extent that the shaping surface areas come close to the sheet of glass on said ring mold;

developing a first vacuum in said first suction chamber at a first time to attract a first area of the sheet of glass against the first shaping surface area to shape the first area of the sheet of glass and then developing a second vacuum in said second suction chamber a second time to attract a second area of the sheet of glass against the second shaping surface area to shape the

second area of the sheet of glass complementary to the first area, said first time being before said second time so that the sheet of glass is successively brought against the first and second shaping surface areas; and

then releasing the sheet of glass from the first and second shaping surface areas of the suction mold onto a quenching ring and moving the sheet of glass on the quenching ring to quenching.